

An E-Quiz System: A Pathway to Improve English Learning for Preschoolers in Rural Areas

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HIGHLIGHTS

- Interactive e-quiz are used to assess children's learning progress.
- The significant barrier to preschool children learning English was a lack of Languages.
- Preschool education development in rural areas needs to change from traditional to modern learning.
- This project testing was reviewed using the principles of interactive multimedia.
- ADDIE Model was used to develop E-Quiz English Learning to gain children's interest and ease the teacher to put the score into the system.

ABSTRACT

E-Quiz Systems is a system that replaces manual techniques, which are paperless methods often utilised in rural preschools. This paper presents an interactive web-based solution to assist students and teachers in rural regions with English language learning and instruction. This study attempts to motivate preschoolers in rural locations to learn English while providing instructors with interactive web-based methods to measure their students' knowledge levels. A web-based application system is created to display e-quiz questions using the interactive multimedia principles of multiple media types and navigation with user input. Using interactive multimedia concepts, an E-Quiz System is designed to serve as an interactive quiz for English learning. ADDIE Model was the approach employed in this project. In addition, this project underwent testing for functionality and usability. As a contribution, it has been established that this study will give a pathway that piques children's interest in learning English and makes it simpler for instructors to evaluate children's growth using the E-Quiz System score.

Keywords: E-Quiz System, Web-based, Preschool, Rural area

INTRODUCTION

The E-Quiz system is gaining in popularity now. As worldwide technology progresses, automated systems will gradually replace manual processes. A researcher indicated that quizzes had become an effective tool for promoting learning. In addition, a web-based system with interactive multimedia may be used to



construct e-quiz learning to interest preschool pupils aged 4 to 6. (Heitmann et al., 2021). Legault has demonstrated that e-learning quizzes are an effective means of evaluation if students have correctly received and digested the learning material. The interactive multimedia-based quiz must ask the appropriate questions to gain a good image of where learners stand.

Aside from this, learning evaluation, such as quizzes, is a well-known and often employed aid to education. According to Howe et al. (2018), many learning tools incorporate quizzes. Quizzing has been demonstrated to be one of the most effective teaching strategies. Quizzes are a fantastic learning method because they foster retrieval practice, which is a terrific way to strengthen long-term, educationally relevant information retention. Consequently, this system differs from previous systems in that it is a more participatory website where students and parents may connect via social media to report their scores. This e-quiz learning also aids the teacher, who can simply keep track of student progress. Brusilovsky et al. (n.d.) demonstrate that it can also track student objectives, knowledge, and attitudes growth and development.

Learning and teaching materials have shifted away from the chalkboard in favour of more advanced gadgets that support teaching and learning at all levels of education, from preschool to college (Ismail, 2017). Suppose preschool students are at home, and teachers use the same traditional paper-based instruction approach. Then, children will not do their assignments. With the interactive system, a teacher may conduct an e-quiz to encourage students to do their homework at home. Additionally, alternative learning settings should contain cutting-edge technology that may be used to accomplish educational goals and improve the quality of learning processes. English proficiency is increasingly vital for children's development in various contexts. In preschool, engaging and fun activities teach English as a second language. Learning support is provided by children's growth and ability to relate words to actions (Albaladejo et al., 2018).

Moreover, when we discussed education in rural regions, the primary problem was that they still employ the manual system learnt from paper or a book. When the Covid 19 pandemic occurs, it will harm both students and teachers. Youngsters find it difficult to study at home (Koenig, 2020). The instructor must discover a solution to this issue. As noted by UNICEF (2020), governments and education stakeholders swiftly responded with remote learning regulations mandating instructors' use of electronic resources. Therefore, this paper offers e-quiz learning using an interactive web-based system to enable youngsters to improve their learning and memory skills. The system's user interface and colour scheme will be tailored to keep children interested in their studies.

BACKGROUND

An e-quiz can be used to guide children's English language learning performance. According to Surip et al. (2021), an e-quiz may be used to analyse children's development in particular subject areas, leading them to become more motivated and focused on organising self-study to enhance their performance. Also, this approach utilises a web-based system often accessed using a web browser. Each browser displays web pages in a somewhat unique manner. Consequently, the web-based system must be customised to account for how browsers interact with different web languages such as HTML, XML, Flash, Perl, ASP, and PHP (Sturm et al., 2017).

Preschool is a crucial developmental period for children. In addition, preschool education is well regarded for its significance in fostering pupils' academic development (Li, 2018). It is now essential for parents to invest more time and money in materials and tools to aid their minor children in acquiring knowledge and



achieving future academic and professional success. Reading abilities and understanding of a youngster are determined by his or her training and upbringing (Ismail, 2017). Thus, students who study in rural areas require several resources to assist their education.

Aside from this, children in rural areas complete more menial tasks than their teachers assign. This is because the Covid-19 epidemic forced them to study at home. It is challenging for youngsters to study at home due to their lack of prior schooling and inadequate educational support (Koenig, 2020). Parents must collect their children's homework from the kindergarten instructor in person. In addition, teachers will provide pupils with paper and stationery for completing assignments. Few pupils submitted an assigned purpose when professors requested it. In contrast, when the teacher offers an assignment with multimedia components, all students concurrently finish it. In their research, Wall Art (2021) found that most children like taking quizzes.

In addition, when teachers in rural areas use the e-quiz system on children, it can progress toward modernisation. According to the research by Zhao (2021), the sound impact is that it has supported rural preschool education and has progressed toward modernity. It is thought that applying e-quiz activities in language classes promotes positive emotional aspects like motivation and engagement (Abdul Halim et al., 2020). Based on the traditional education in rural areas, children lack motivation when just doing a quiz question on paper. As a result, because instructors are one of the elements, it is their responsibility to help language courses that will increase children's positive attitudes and motivation to study the second language. As stated by Zhao (2021), platform quizzes enable the changeover of traditional learning techniques to the paperless and inconvenient experience.

METHODOLOGY

This paper adapted the ADDIE model, which is an educational designer's most widely used framework. It features universal principles that assist instructional designers in developing successful support tools through five (5) processes: analysis, design, development, implementation, and evaluation, as illustrated in Figure 1 (Allen, 2021). The ADDIE model will be implied when designing the instruction on this web-based system. As Alnajdi (2018) stated, the ADDIE model is one of several models designed for use in teaching practice when developers decide to develop their procedures.

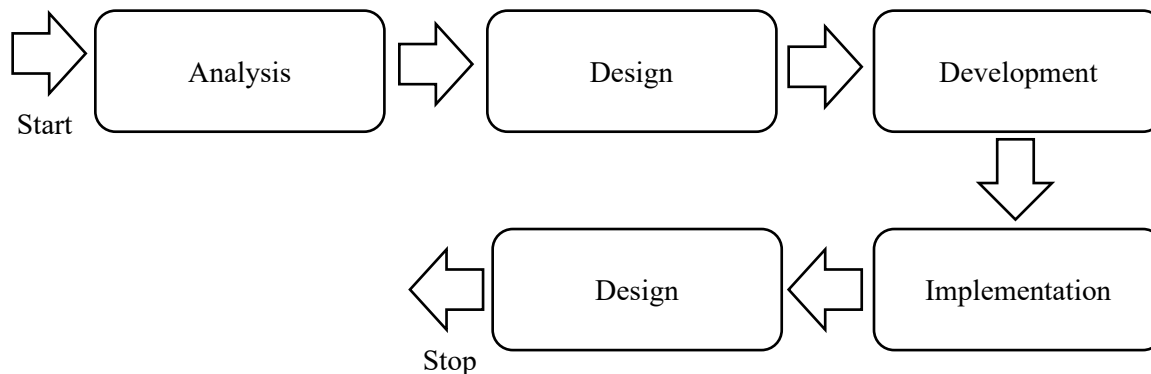


Figure 1: Methodology of the E-Quiz System



Analysis Phase

The first phase is analysis, and the activities carried out are feasibility studies. It was done by reviewing relevant journals, papers and books, and it is a process that requires handling throughout the feasibility study. Notably, the review aimed to find a topic scope outlined in a relevant journal, article or book. It will recapitulate the objectives in this paper.

Design Phase

Before the interface design is conceived, it is crucial to complete the E-Quiz System design, which includes the definition of the needed hardware, software, user interface design, database, and experimental design. The sitemap, storyboard, system flowchart, context diagram, and Entity Relationship Diagram (ERD) are created in this phase. In addition, Figma was utilised to develop the user interface's main page, framework question, and score sketch.

Hardware and Software Requirements

In further detail, hardware refers to every device component that can be physically viewed and handled. In this study, a laptop was utilised as an example. In contrast, the software is a collection of computer-executable instructions that perform various tasks. Most computer code consists of software. In this project, Adobe Animate, Adobe Dreamweaver, Canva, Lucid Chart, and Figma were utilised.

Development Phase

E-Quiz system development involves developing, building, and enhancing websites. According to Indah Septiani et al. (2020), several studies have demonstrated the advantages of interactive multimedia learning, including greater motivation to study. This E-Quiz System will employ persuasive technology to encourage youngsters to answer the quiz question. Several ideas, such as combining various media, navigation, and interactivity, have been implemented in this study.

Development in Adobe Animate

E-quiz system creation in Animate will incorporate all multimedia features. Throughout the development of this Animate, multimedia elements like text, images, and audio will be included in the website. First, the text serves to convey meaning since, in comparison to images, writing typically bores the viewer. Text components may be used sparingly or as a user aid, such as on application buttons. Second, images serve as the text's background to create a beautiful framework. The featured image must correspond with the intended topic or title. Attractive visuals can increase the user's concentration on an application. The picture dimensions must be suitable so as not to interfere with the readability of the text.

Audio, on the other hand, helps to reinforce the message and attract the user's attention. The audio must also be appropriate to prevent interference with the intended message. Typically, audio will be included to make the presentation more engaging and captivating. Audio may also be utilised to improve





motivation, create a more engaging environment, and increase user concentration on the information being given. Figure 2 depicts all of the E-Quiz system's components.

Figure 2: Text, graphics and audio on the E-Quiz System

Development of E-Quiz System

Figure 3 depicts the E-Quiz System's teacher page. Teachers can submit students' scores into the system. As seen in the illustration, the instructor must input the student's number, name, score, and age. After submitting a new score, our E-Quiz System makes it easy for teachers to view all previous score records. The system was created without using any additional pages.

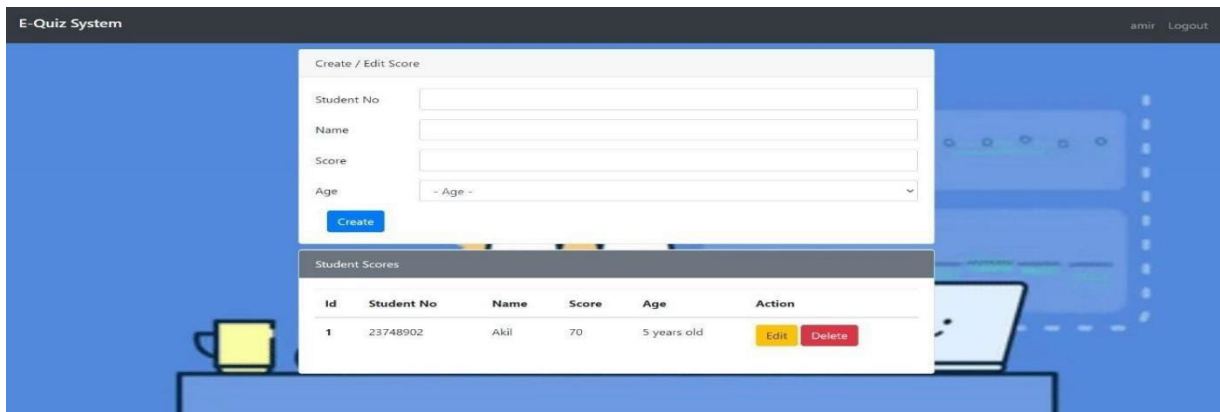


Figure 3: Teacher Page of the E-Quiz System



Next, the first implemented principle is the incorporation of different media. As demonstrated in Figure 4, this approach was used to persuade the youngsters by inspiring them with music, visuals or symbols, and text.

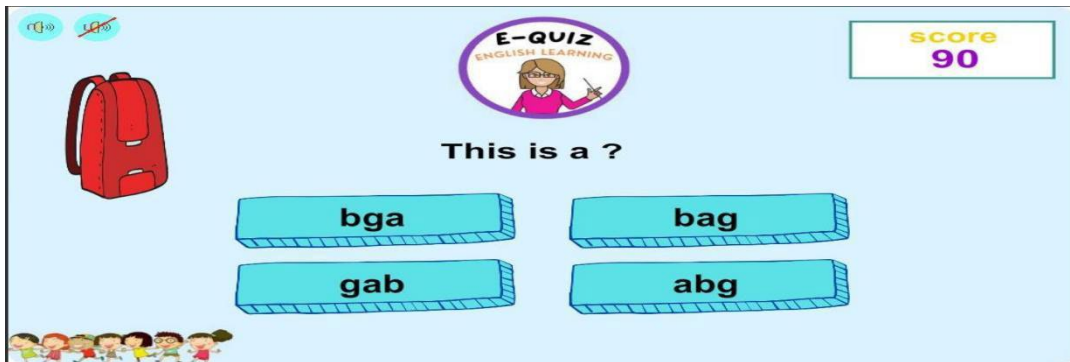


Figure 4: Principle Integrating Diverse Media in E-Quiz System

Following is the navigation and interaction principle. This notion was used to illustrate that navigation is a form of communication in which the media output is dependent on the children's input. In the meanwhile, the interaction requires youngsters to select the proper response. Figure 5 depicts the second interactive multimedia concept.

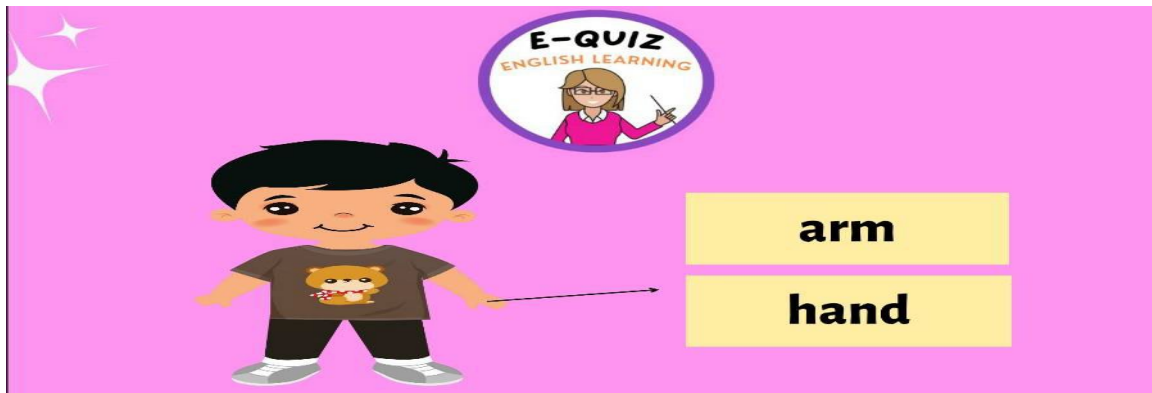


Figure 5: Principal Interaction and Navigation in E-Quiz System

THE E-QUIZ SYSTEM EVALUATION

This research, E-Quiz System, has multimedia features that can encourage youngsters to learn more. Compared to when they completed a question on paper, youngsters did not increase interest in completing the quiz. In addition, the relevance of the E-Quiz system involves instructors who may determine their kindergarten students' English comprehension level. In this situation, a child's E-Quiz System score may be watched by his or her instructor, who will enter the score into the E-Quiz System. The E-Quiz system does not require an internet connection for children to answer the quiz, as it can be accessed offline. This will make the teacher's job easier since they will not have to set up the internet connection for the students to take the E-Quiz System quiz.



The proposed E-Quiz system’s functionality and usability were established to evaluate its performance, as described in the following section.

Results

Functionality testing is carried out to guarantee that each of a system’s features operates in line with the need or specification. This project underwent functional testing to evaluate the operation of the E-Quiz system component. Each component was tested per the specifications stated before the test. Participants in this evaluation were three individuals. Following that, the ‘login as instructor’ operation was successful. Because the user can provide their username and password, they may quickly click the button after logging onto the page and add the second action to the new score by clicking the ‘add’ button. The user may quickly add a new score to the E-Quiz System by clicking the add button. Thirdly, the action to “click the update button to modify score” was successful, as the user can adjust their score by clicking the update button. In addition, the ‘delete button’ action can be eliminated, as the user can delete their score from the E-Quiz System by clicking the delete button. In addition, the score can be eliminated by selecting or erasing all scores. Aside from this, the final step in functional testing is the user selecting their age using the right button. Overall, this examination was successful since the user selected the age button according to the question. This may be because it was simple for them to identify the button when the query asked about the user’s age. Following that, the results of the functional testing are displayed in Table 1.

Table 1: Results of the Functionality Testing

No	Activity	Expected Result	Result
1	Login as ‘Teacher’	- Login successfully - The teacher page can be open	Pass
2	Click add button to add new score	- Teacher can add a new score	Pass
3	Click the Update button to edit score	- Teacher can update the score if they want to make a change to it	Pass
4	Click the delete button to delete score	- Score can be deleted	Pass
5	Select age with the right button on it	- The selected button match with children age question	Pass
6	Select the right button to answer the question	- Answered button can be clicked	Pass



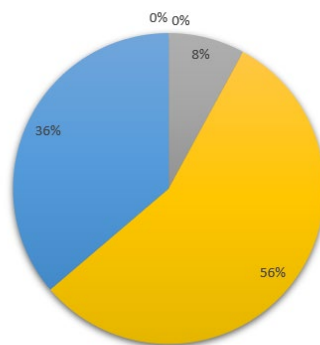
Usability testing was undertaken to determine how user-friendly the system was. Twenty-nine kindergarten students participated as responders in this evaluation. During this test, the researcher sat next to the participants to assist them in completing the questionnaire rating the system’s usability. Other responders were teachers who answered the questionnaire as respondents. This E-Quiz System improves children’s incentive to study English and allows teachers to submit scores effortlessly. This examination was carried out only using an online platform. The instructor got a text message via WhatsApp, including links to the E-Quiz System assessment questionnaire. Before rating the usefulness of the E-Quiz System in the given questionnaire, they were required to do E-Quiz System tests. This usability testing included a total of 30 participants. According to Table 2, 14.2 per cent of the assessment responders were young boys. Likewise, the remaining 54.8% were female children, comprising all respondents aged 4 to 50.

Table 2: Usability Testing Demographic Background

Demographic		Frequency	Percentage (%)
Gender	Male	14	45.2
	Female	17	54.8
Age	4 years old	7	22.6
	5 years old	8	25.8
	6 years old	14	45.2
	40 – 50 years old	2	6.4

In this evaluation, usability testing was undertaken in five sections: the user interface, usefulness and usability, content, navigation, and usability. As shown in Figure 6, usability testing reveals that most respondents (56% of respondents) agreed with the perceived usability of the E-Quiz System. The percentage of respondents that selected neutral, agreed, and strongly agreed with the questions addressing usability testing is presented in Table 3.

Percentage of Agreement for Perceived Usability



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Legend: ■ Strongly Disagree ■ Disagree ■ Neutral ■ Agree ■ Strongly Agree

Figure 6: Percentage of the agreement for perceived usability on the E-Quiz System

Table 3: Number of responses to the usability testing

Scale Name	Scale	No	Percentage
Strongly Disagree	1	0	0%
Disagree	2	0	0%
Neutral	3	19	8%
Agree	4	134	56%
Strongly Agree	5	87	36%

Discussion

Based on this information, most respondents agreed with the E-Quiz System. Initially, the E-Quiz System appeared appealing. Thus, it can boost student motivation and interest in responding to E-Quiz System questions. In addition, the E-Quiz system is user-friendly for youngsters since they may select their age before answering questions. This is because all of the questions created by the system were based on what the professors had taught.

Meanwhile, the instructor may easily enter the grade into the system after logging in. After logging in, the scoring system is displayed. In addition, the instructor will not be required to locate the score entry location inside the E-Quiz System. In addition, children can utilise E-Quiz System without an online connection.

In addition, children do not need to pay for data because the system may be utilised offline. Aside from this, pupils can get their results without waiting for the instructor to inform them. Before this, they must await their instructor's marking and distribution of their grade. Using the E-Quiz System, the score will show once the question has been answered. In conclusion, the E-Quiz System was able to motivate and inspire students, along with all the interactive multimedia concepts built via the system's design, which elicited a beneficial reaction from both children and instructors.

CONCLUSION AND RECOMMENDATIONS

In conclusion, an interactive E-Quiz System was produced to promote children's interest in learning English and to facilitate instructors' submission of the children's results. This project was created utilising interactive multimedia concepts to improve the E-Quiz System's multimedia interface. Interactive multimedia is an electronic technology system that enables children to engage with and alter many media types, such as text and sound. This website is allegedly designed to encourage youngsters to learn English.



Teachers can also identify students' levels depending on the E-Quiz System's score. This project went through several phases to accomplish all of its stated goals.

However, there are suggestions for more study and development on this subject. When responding to a quiz question, it may be the subject of future investigation of how a teacher might convey instructions to students using audio. It may assist youngsters as they answer the question in the system. In addition, the method might be enhanced by displaying the outline of the incorrect question after the score appears on the screen. Because, based on the incorrect answer, the instructor may determine which concepts the student did not comprehend.

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CONFLICT OF INTEREST DISCLOSURE

All authors declare that they have no conflicts of interest to disclose

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